

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
22 January 2004 (22.01.2004)

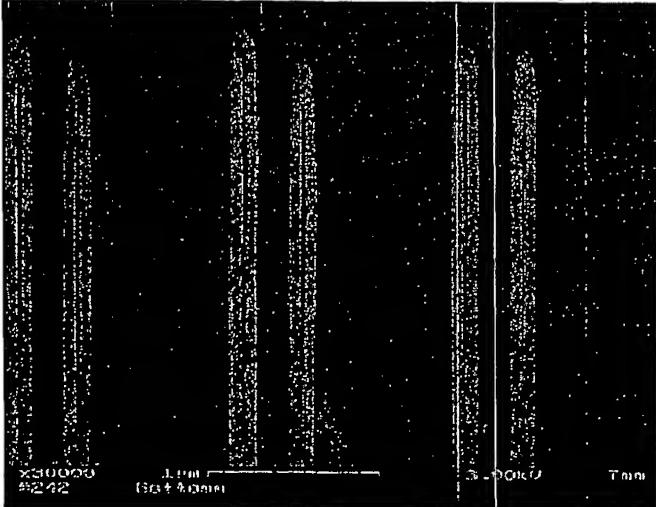
PCT

(10) International Publication Number  
WO 2004/007796 A1

- (51) International Patent Classification<sup>7</sup>: C23C 16/34, (74) Agents: SCOZZAFAVA, Mary, Rose et al.; Hale and Dorr LLP, 60 State Street, Boston, MA 02109 (US).
- (21) International Application Number: PCT/US2003/021281 (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 9 July 2003 (09.07.2003) (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (25) Filing Language: English (71) Applicant (*for all designated States except US*): PRESIDENT AND FELLOWS OF HARVARD COLLEGE [US/US]; 17 Quincy Street, Cambridge, MA 02138 (US).
- (26) Publication Language: English (72) Inventors; and (75) Inventors/Applicants (*for US only*): GORDON, Roy, G. [US/US]; 22 Highland Street, Cambridge, MA 02138 (US). SUH, Seigl [KR/US]; 5330 Case Avenue #423, Pleasanton, CA 94568 (US). BECKER, Jim [US/US]; 7 Cottage Street, Cambridge, MA 02139 (US).
- Published:  
 — with international search report  
 — before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

*[Continued on next page]*

(54) Title: VAPOR DEPOSITION OF TUNGSTEN NITRIDE



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(57) Abstract: Tungsten nitride films were deposited on heated substrates by the reaction of vapors of tungsten bis(alkylimide)bis(di-alkylamide) and a Lewis base or a hydrogen plasma. For example, vapors of tungsten bis(*tert*-butylimide)bis(dimethylamide) and ammonia gas supplied in alternate doses to surfaces heated to 300 °C produced coatings of tungsten nitride having very uniform thickness and excellent step coverage in holes with aspect ratios up to at least 40:1. The films are metallic and good electrical conductors. Suitable applications in microelectronics include barriers to the diffusion of copper and electrodes for capacitors. Similar processes deposit molybdenum nitride, which is suitable for layers alternating with silicon in X-ray mirrors.

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